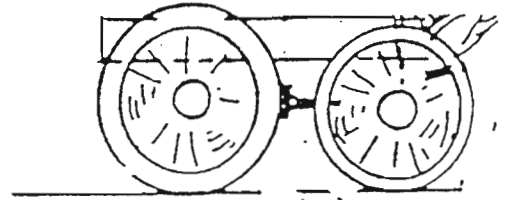


MECHANICAL ABILITY

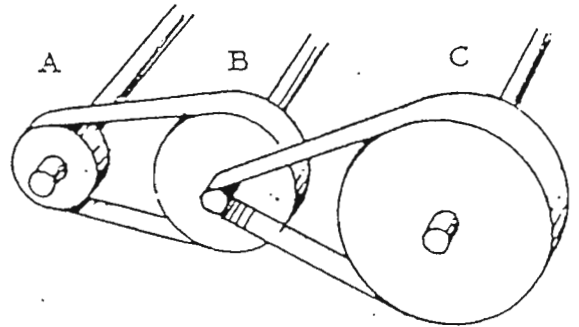
There is no way we can provide you with all the information needed to become skilled in this subject. However, we offered some basic facts below that we recommend you look over carefully before trying the exercises.

ILLUSTRATIONS

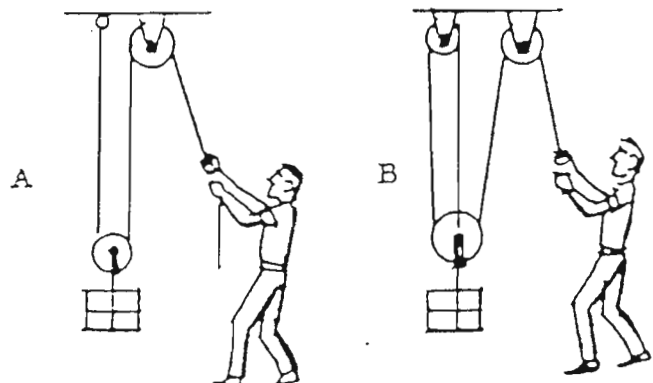
1. If a moving vehicle has wheels of different sizes, the smaller wheels will turn faster.



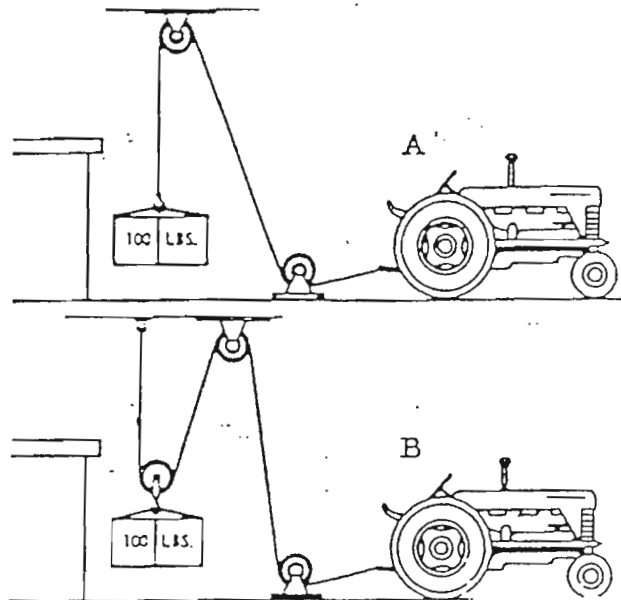
2. When wheels of different sizes are joined together by belts, the smaller wheels will turn faster.



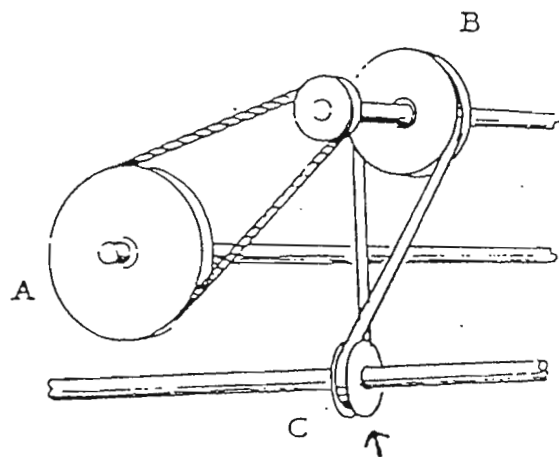
3. The more pulleys, the easier it is to lift an object.



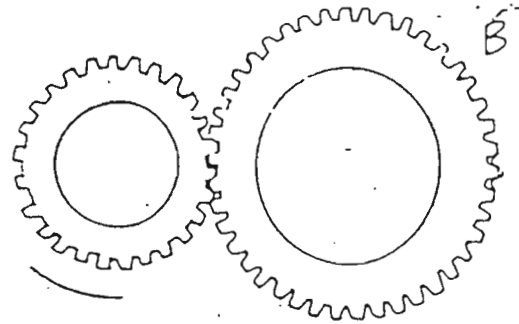
4. The more pulleys involved, the greater distance you must pull an object, but it is still easier.



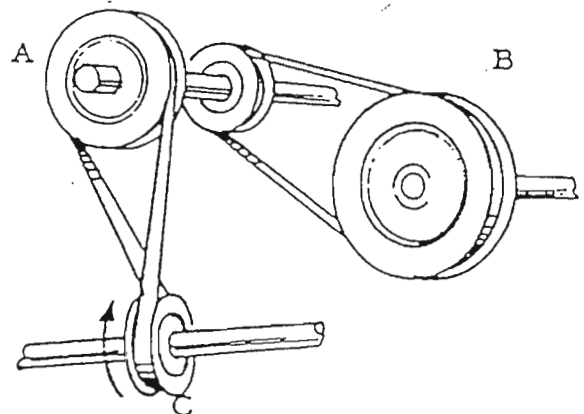
5. Pulleys of the same size connected by a shaft turns at the same speed. A smaller pulley connected to a larger pulley by belts turns faster than the larger pulley.



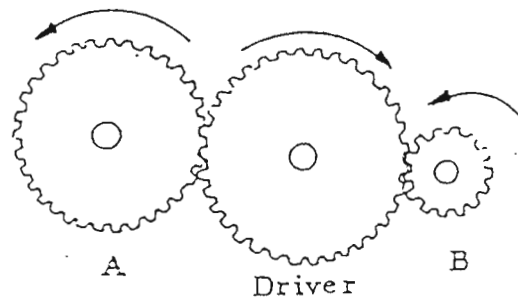
6. When two gears of different sizes are meshed together, the smaller gear turns faster.



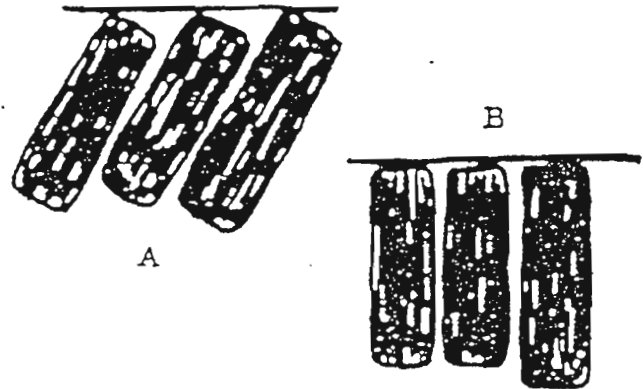
7. When looking at turning wheels in a diagram, determine in which direction one of the wheels is turning. The belt goes in the same direction as the wheels.



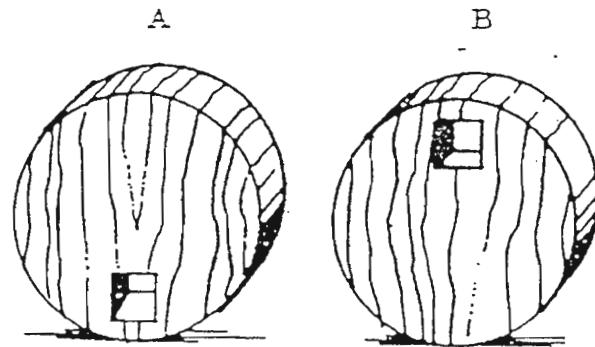
8. Mesh gears turn in opposite directions. Every other gear turns in the same direction.



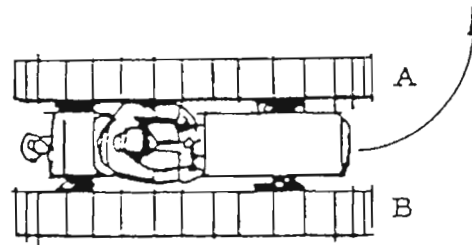
9. Objects placed parallel to each other and perpendicular to the side, occupy less space.



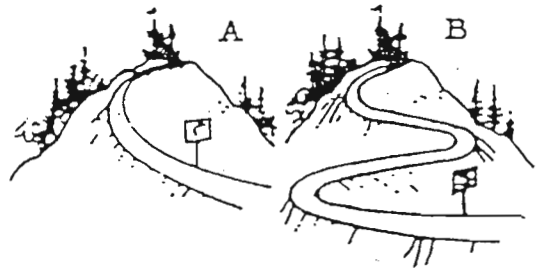
10. A solid wheel-shaped object with a space drilled out will rest on the section that is solid.



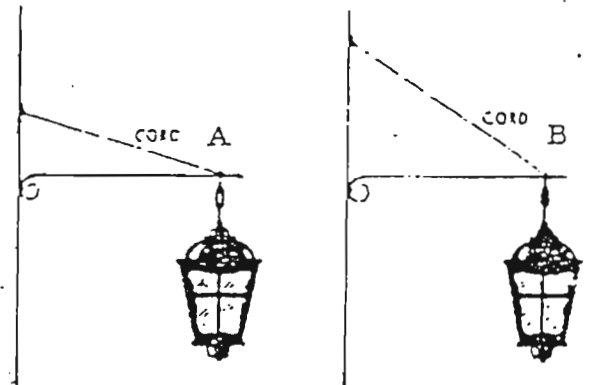
11. If a car or tractor or an object is turning, the inside wheels will travel less distance and turn more slowly.



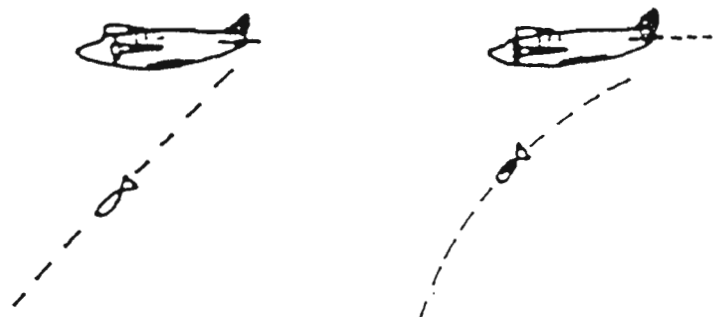
12. The road with the straightest path has the steepest incline.



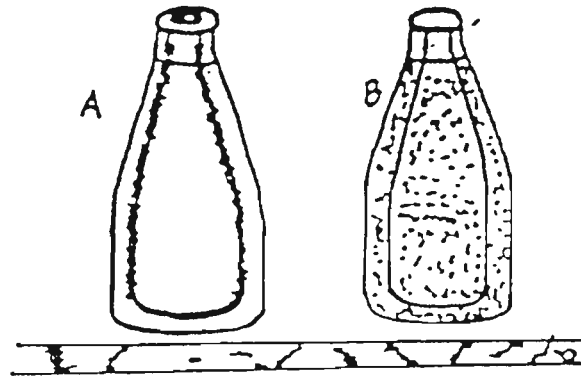
13. The further out an object is, the harder it is to support. The best support forms the biggest triangle.



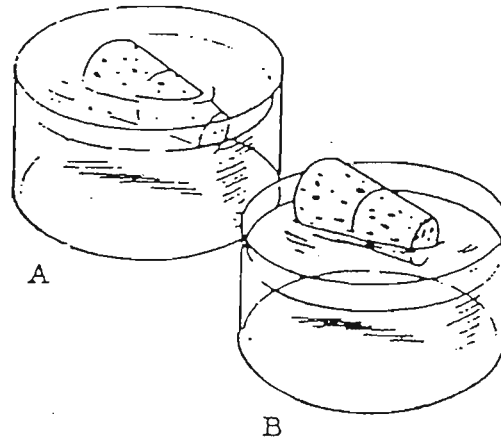
14. Bombs fall from an airplane in a curve.



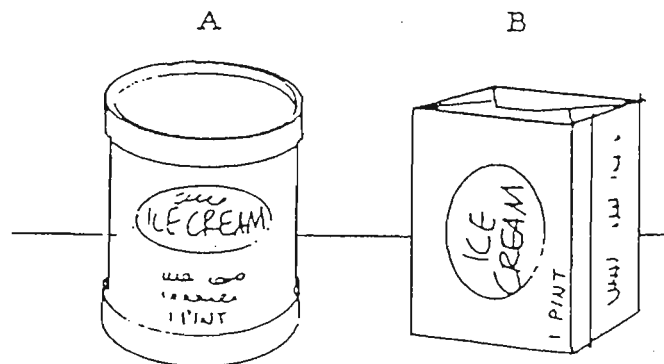
15. An object recently removed from the refrigerator has droplets of condensed water vapor formed on it.



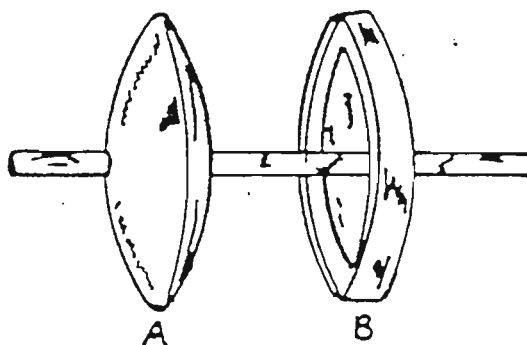
16. The higher an object floats, the heavier the liquid it is in.



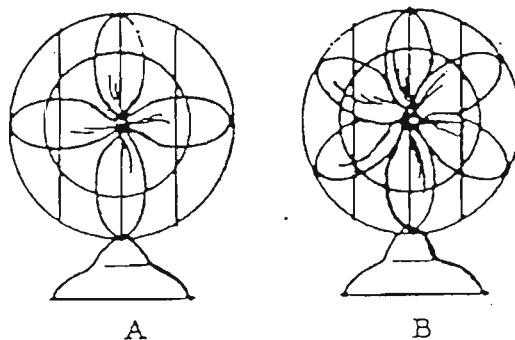
17. An equal amount of ice will melt slower in a cylindrically shaped container because a cylinder has the least amount of surface area in contact with the surrounding air.



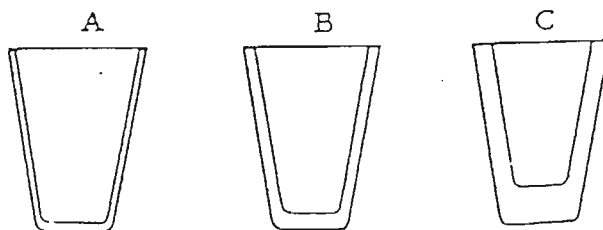
18. For very high speed, the safest wheel is the one that is thick at the axle and thin at the edge.



19. The more blades an electric fan has, the more power is needed to turn it.



20. When a hot liquid is poured into glass containers of different thickness, the thickest glass is most likely to break.



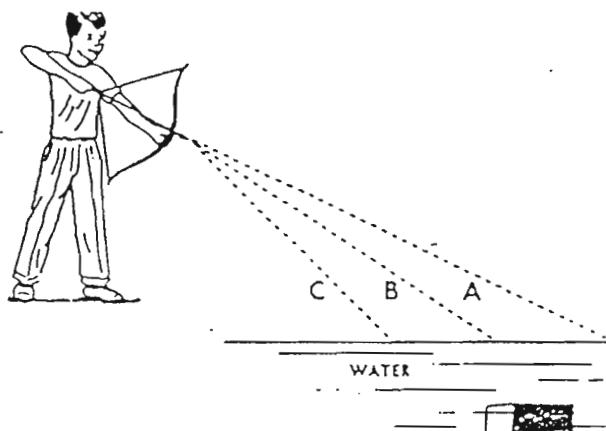
MECHANICAL REASONING EXERCISES

The following exercises are given to you for the purpose of determining how well you understood the foregoing illustrations.

QUESTIONS

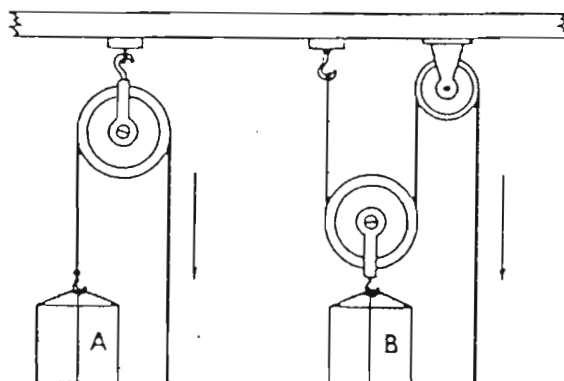
1. Along which line should the arrow be aimed in order to hit the object?

A B C



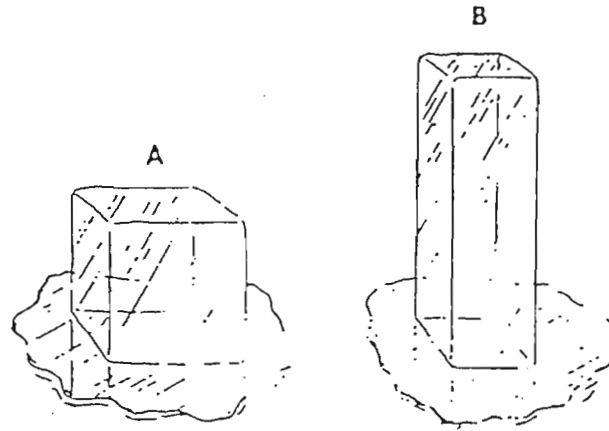
2. Which weight requires the least force pulling down on the rope to lift, if A and B are equal? If there is no difference, mark C.

A B C



3. Which piece of ice will melt faster? If they will melt equally fast, mark C.

A B C



4. In which direction will the ball go if the boy releases the string when the ball is at X?

A B C D

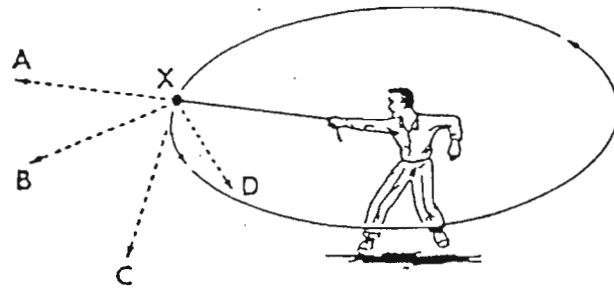
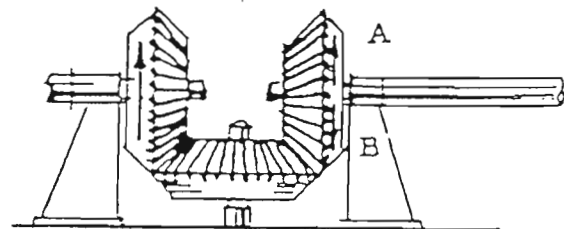


FIG. 39

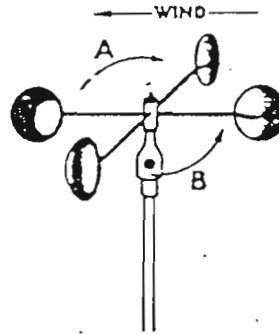
5. If the left-hand gear moves in the direction shown, in which direction will the right-hand gear move?

A B



6. When the wind blows in the direction shown, in which direction will the airmeter turn, A or B? If it will not move, mark C.

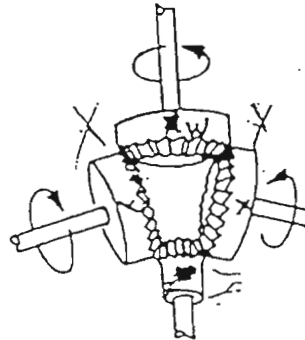
A B C



7. When wheel W turns in the direction shown:

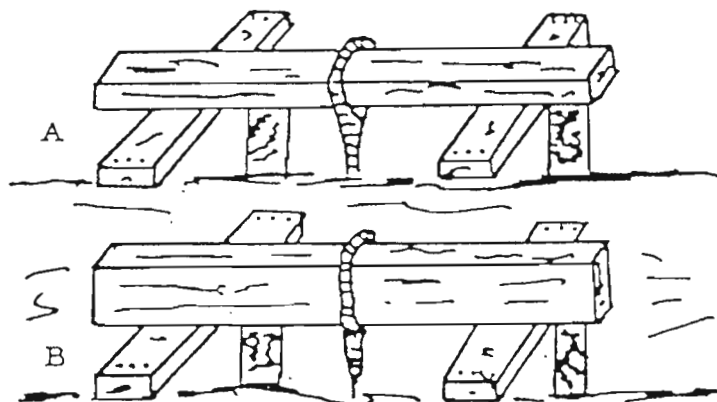
- Wheel z turns in the opposite direction.
- Wheel x turns in the direction shown.
- Wheel y turns in the direction shown.

A B C



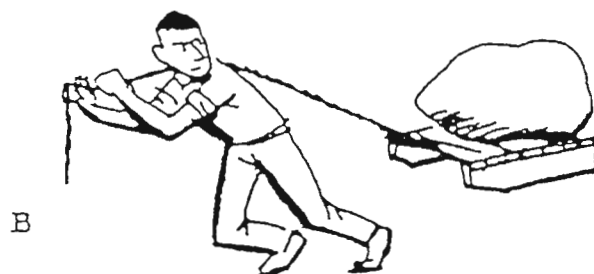
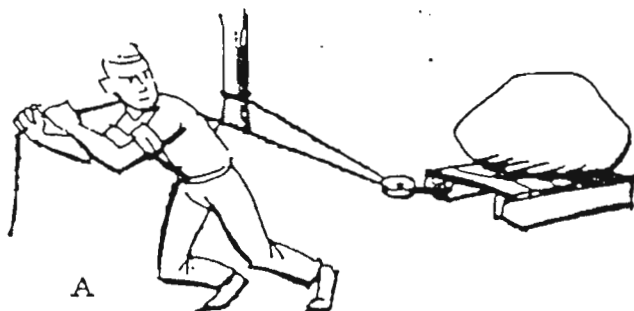
8. In which picture can you safely put a heavier weight on the rope? (If equal, mark C).

A B C



9. Which horse must go faster to hold his place on the turn?
(If equal, mark C)

A B C

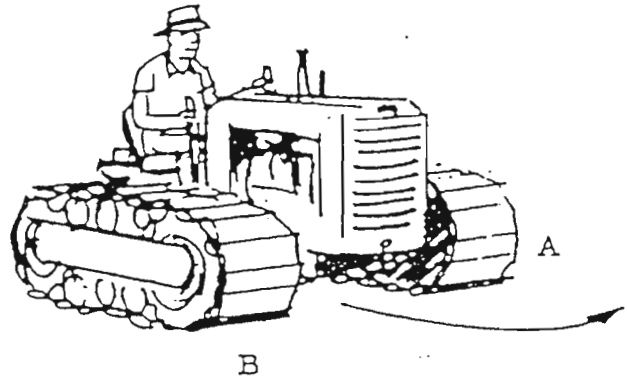


10. Which man has to pull harder? (If equal mark C)

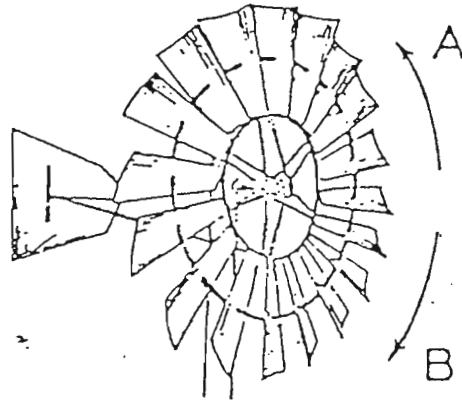
A B C

11. Which tread should move more slowly for the tractor to turn in the direction shown? (If neither, mark C)

A B C

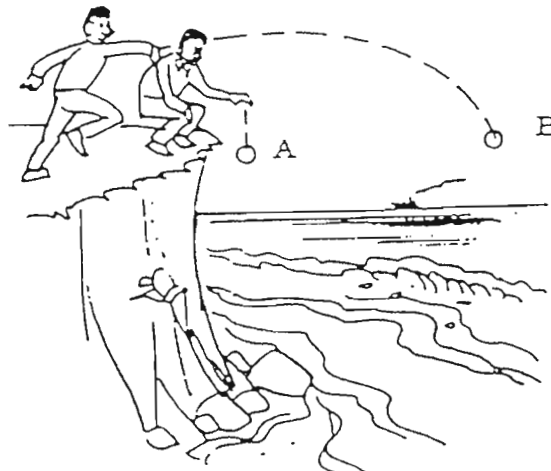


12. In which direction is the windmill more likely to turn? (If either mark C)



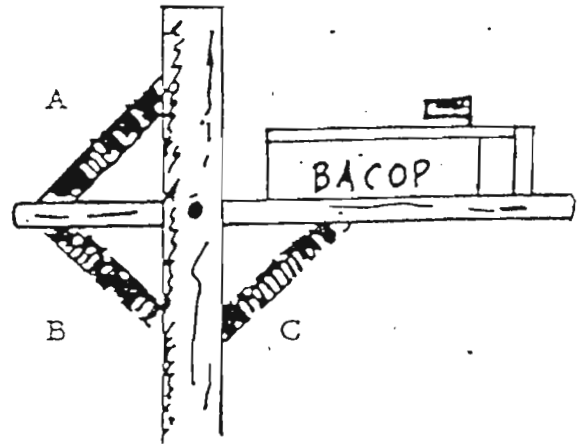
13. If one ball is thrown straight out and the other one dropped at the same instant from equal height, which will hit the water first? (Use C for the same)

A B C



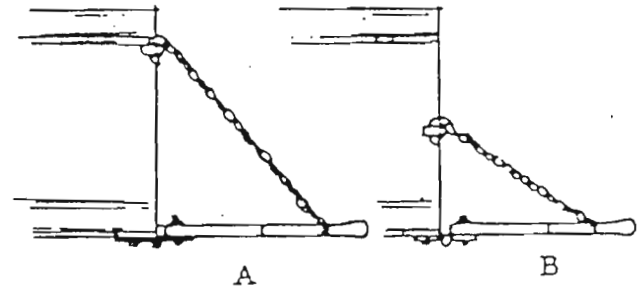
14. Which one piece of chain is needed to support the mail box?

A B C



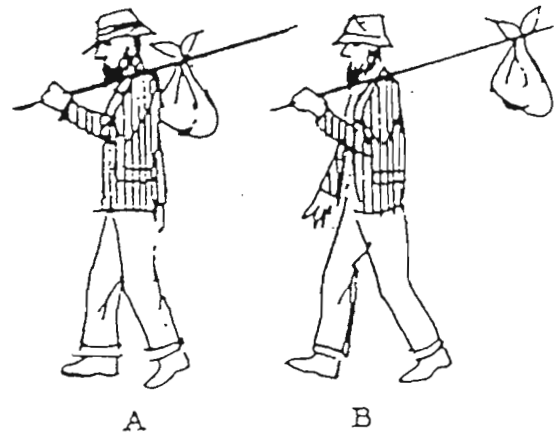
15. Which chain has more strain put upon it?
(If equal, mark C)

A B C



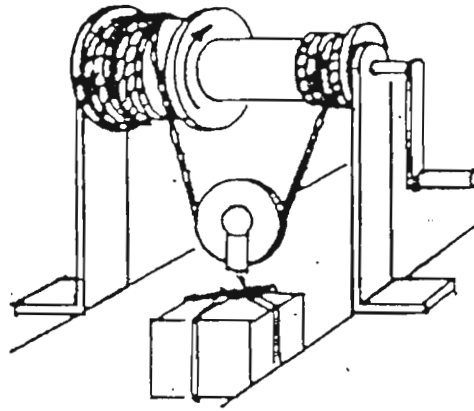
16. Which way will the bundle be easier to carry?
(If equal, mark C)

A B C



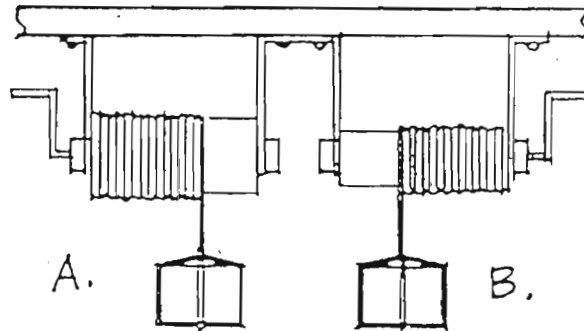
When the windlass is turned in the direction shown, the weight will:

- a. fall
- b. stand still
- c. rise



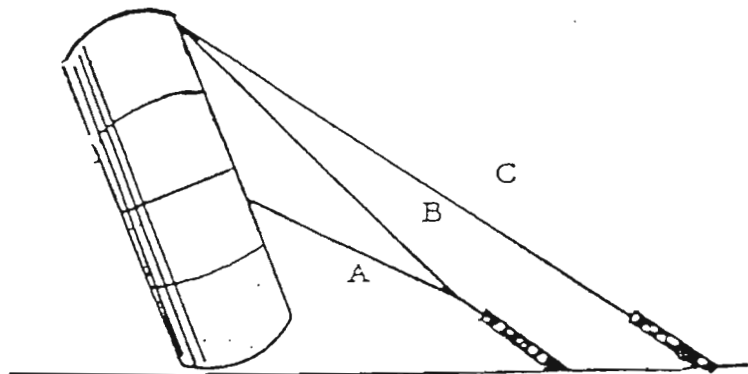
18. With which windlass can a man lift the heavier weight?
(If either, mark C)

A B C



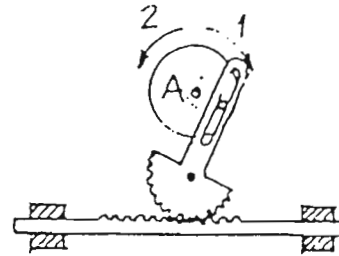
19. Which one piece of cable will give this tank the best support?

A B C



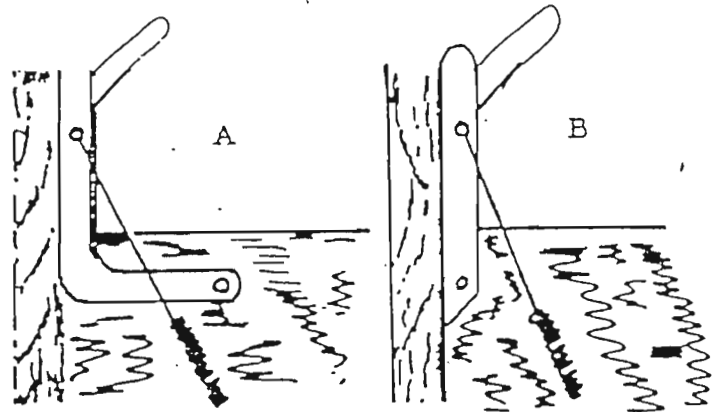
20. When this mechanism is in operation, wheel A

- 1 must turn in direction one
- 2 must turn in direction two
- 3 may turn in either direction



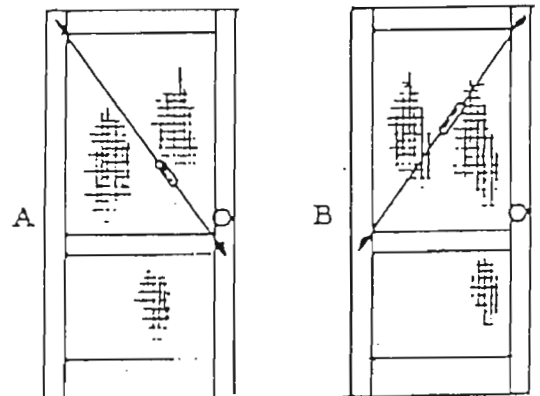
21. In which picture will the spring hold the handle where it now is?
(If both, mark C)

A B C



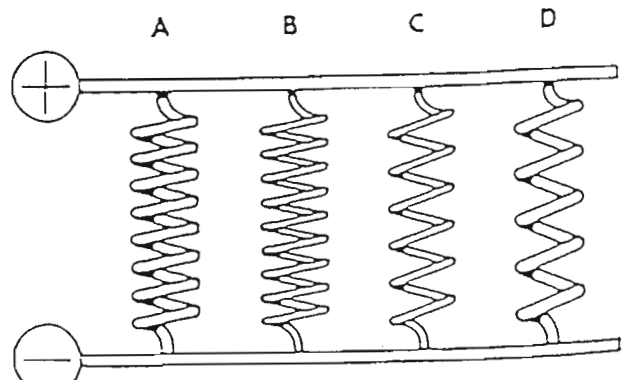
22. Which is the better way to brace a screen door to keep it from sagging?
(If both, mark C)

A B C



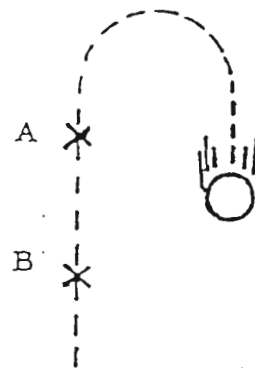
23. Which one of the four coils of copper wire will the flow of electrical current be smallest?

A B C D



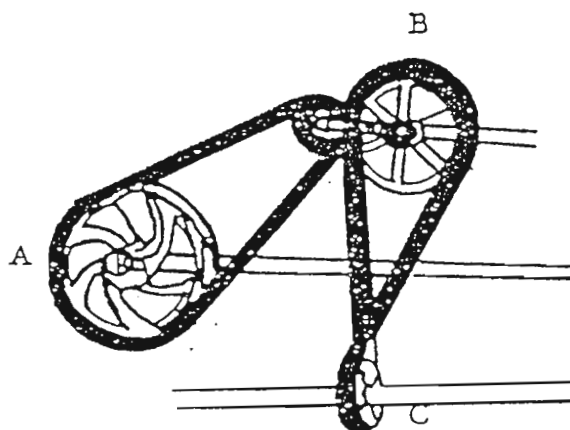
24. At which point is the ball going faster?
(If equal, mark C)

A B C



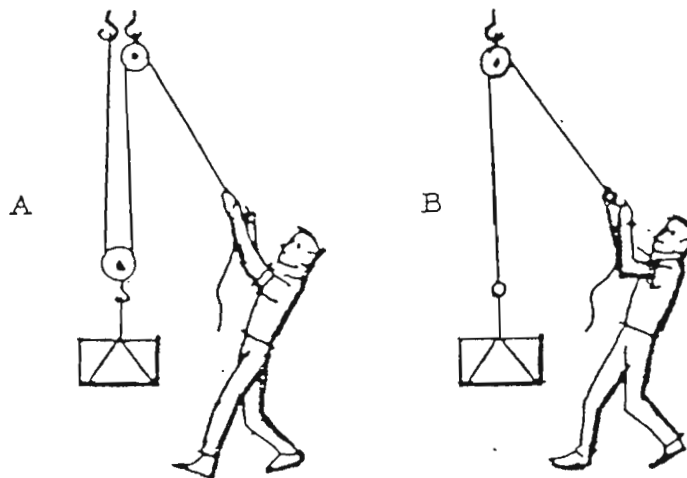
25. Which shaft will turn most rapidly?

A B C



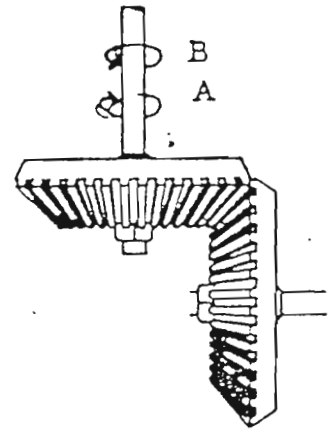
26. Which man can lift the load more easily?
(If equal, mark C)

A B C



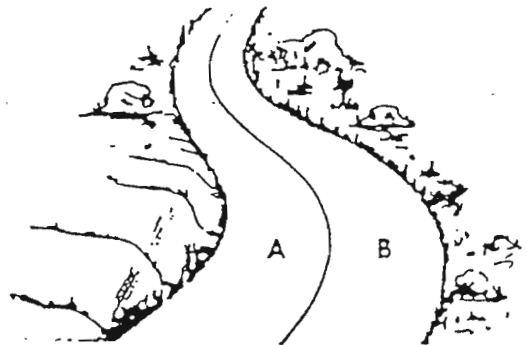
27. When the right-hand gear turns in the direction shown, which way does the top gear turn?
(If neither, mark C)

A B C



28. In the construction of a curve in a highway as shown to the right, which one of the following is good practice?

- 1 make B higher
- 2 make A higher
- 3 make both A and B the same



29. Which object will turn over more easily?
(If equal, mark C)

A B C

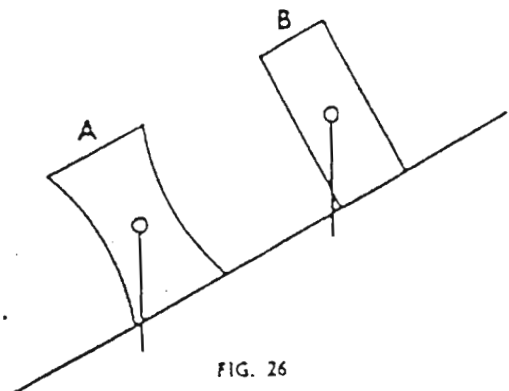
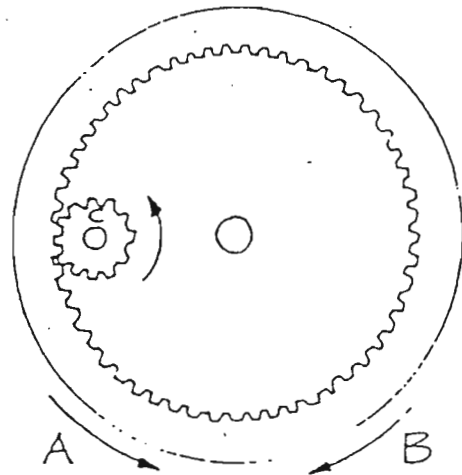


FIG. 26

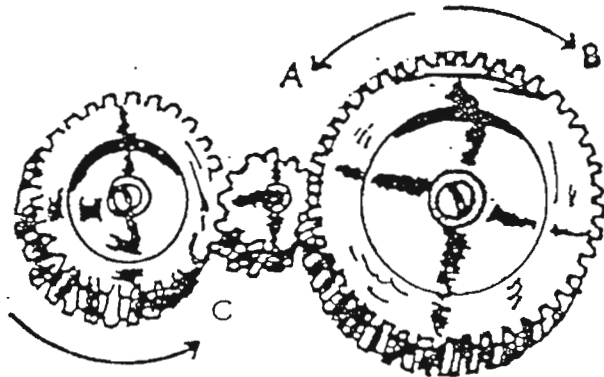
30. If the small wheel turns in the direction shown by the arrow, which way will the big wheel turn?

A B C



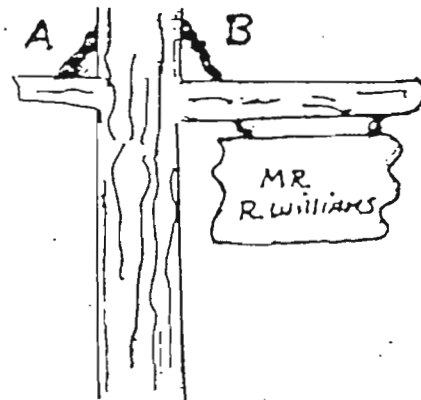
31. When the left-hand gear turns in the direction shown, which way does the right-hand one turn?
(If either, mark C)

A B C



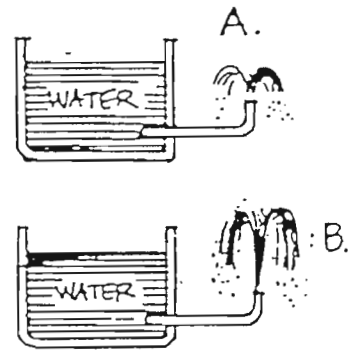
32. Which chain alone will hold up the sign?
(If either, mark C)

A B C



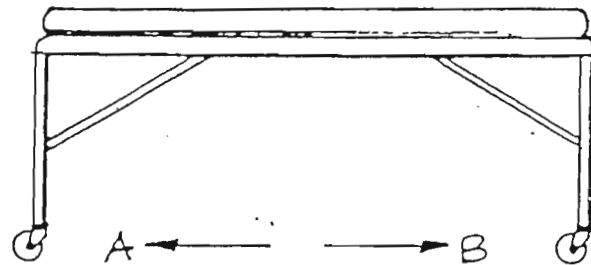
33. Which picture shows what would actually happen?

A B



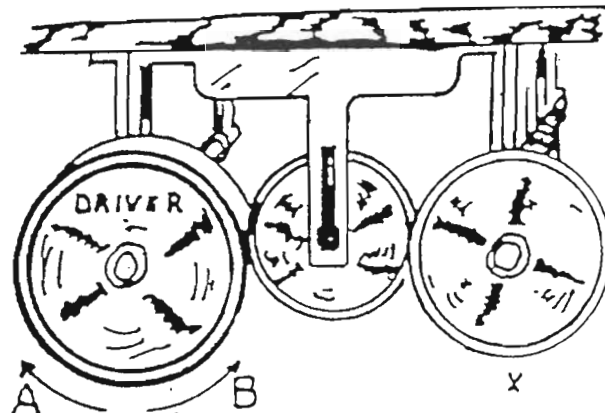
34. Which way has this bed just been rolled?
(If either; mark C)

A B C



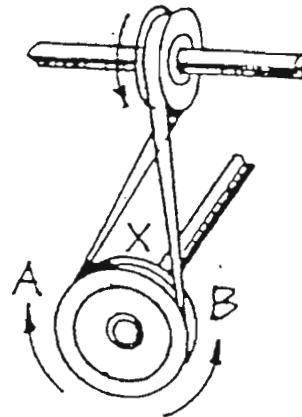
35. Which way must the driver turn to drive the wheel "X"?
(If either mark C)

A B C



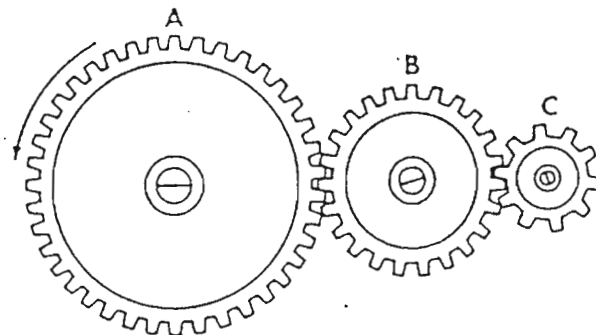
36. When the top pulley turns in the direction shown, which way will the lower pulley turn?
(If either, mark C)

A B C



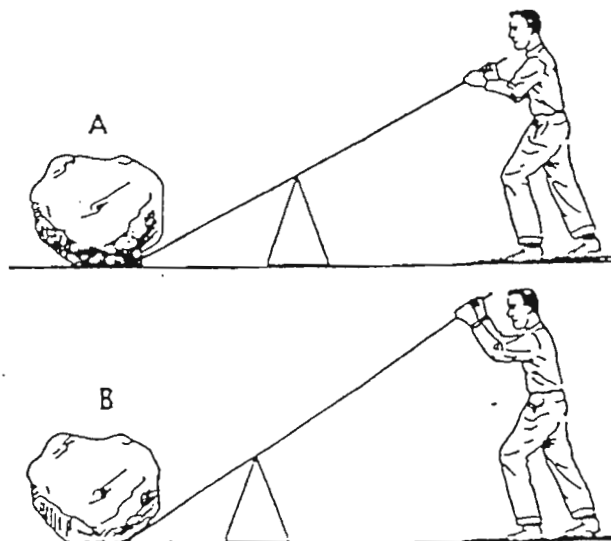
37. Which gear turns the largest number of times in a minute?

A B C



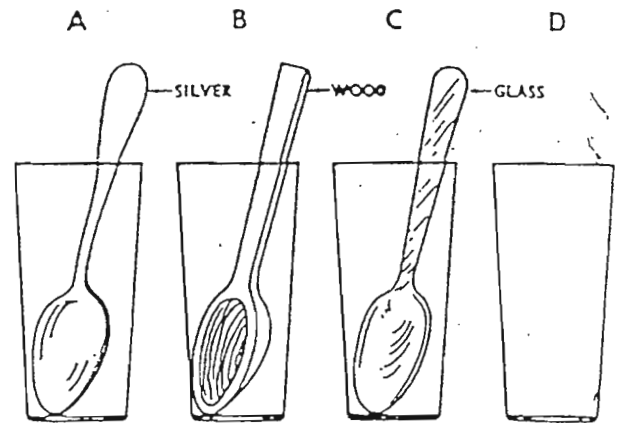
38. Which rock will take the least force for the man to move if they weigh the same?
(If the same, mark C)

A B C



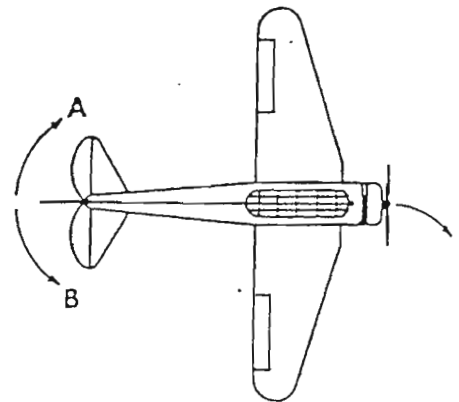
39. Which glass is least likely to break when boiling water is poured into it?

A B C D



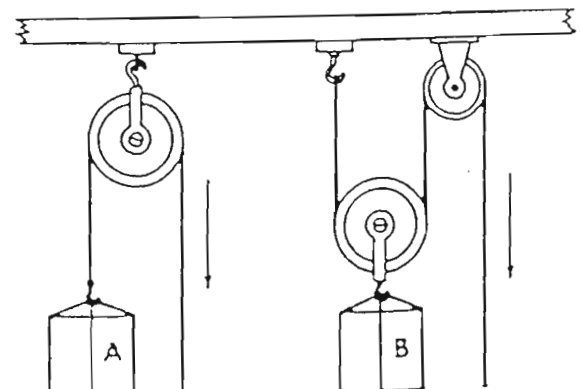
40. When the plane is to be turned in the direction shown, in which direction must the rudder be turned? If it will turn in the direction shown without change of direction of the rudder, mark C.

A B C



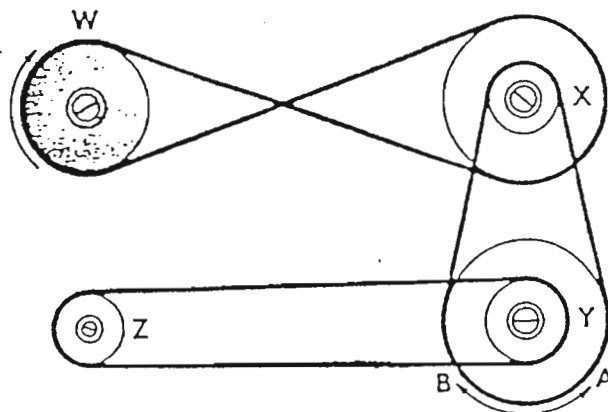
41. Which weight, A or B, will require the least force pulling down on the rope to lift if A and B are equal in weight? If there is no difference, mark C.

A B C



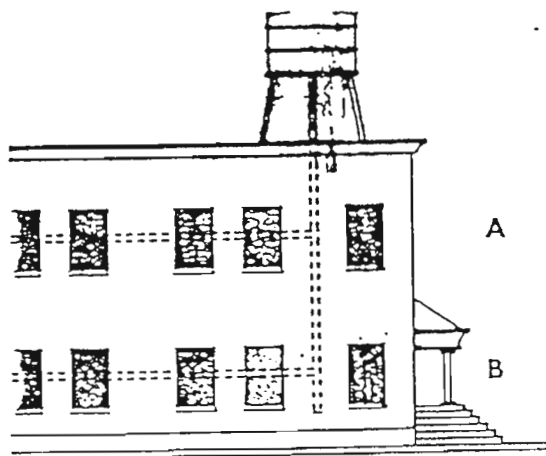
42. With the driver W turning in the direction shown, in which direction does Y turn?

A B



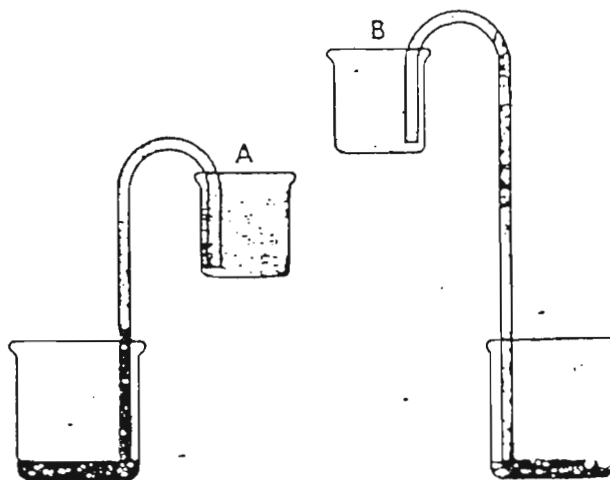
43. With the water in the building coming from the tank as shown, on which floor will the water be discharged with the greater force? If the force of the water is equal on the two floors, mark C.

A B C



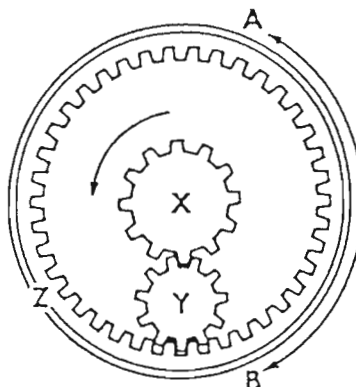
44. Which container will empty faster?

A B



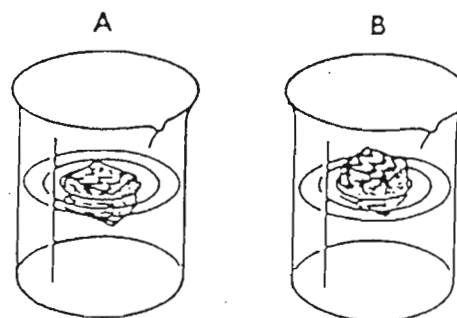
45. When gear X turns in the direction shown, in which direction will Z turn?

A B



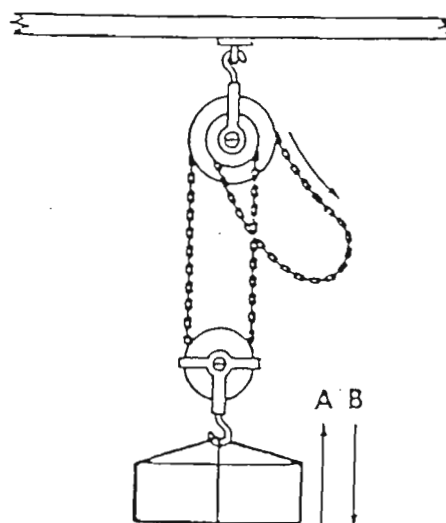
46. Two pieces of wood of the same size and weight are floating in the containers, A & B. Which container holds the heavier liquid?

A B



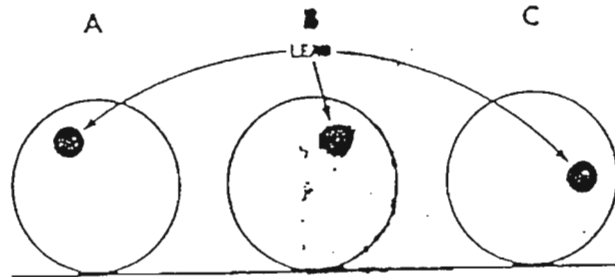
47. When the chain is pulled in the direction shown, in which direction will the weight move, A or B? If it will not move, mark C.

A B C



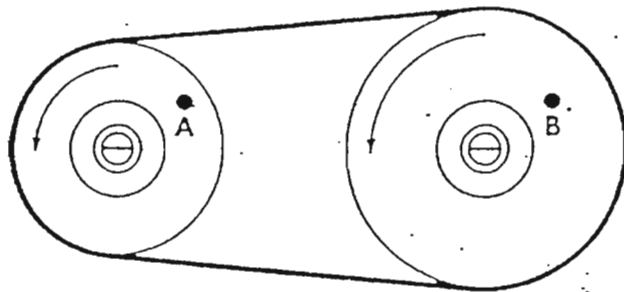
48. Which wooden ball will roll to the left?

A B C



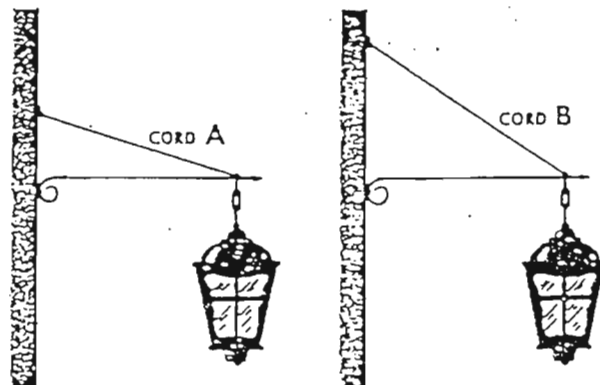
49. Which black spot moves faster when the wheels turn in the direction shown?

A B



50. Which taut cord is more likely to break?

A B



ANSWERS

1. C
2. B
3. B
4. A
5. B
6. A
7. A
8. B
9. A
10. B
11. A
12. A
13. C
14. B
15. B
16. A
17. C
18. B
19. C
20. 2
21. A
22. A
23. B
24. B
25. C

26. A
27. B
28. 1
29. B
30. A
31. A
32. B
33. A
34. B
35. A
36. A
37. C
38. B
39. A
40. B
41. B
42. A
43. B
44. B
45. B
46. B
47. A
48. A
49. A
50. A